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EXAMINER	
LAVARIAS, ARNEL C	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,438	HALLDORSSON, THORSTEINN	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- Th MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-35,40,43 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-35,40,43 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The Examiner acknowledges the submission of the Supplemental Application Data Sheet in the reply dated 4/15/04. In view of this submission, the Examiner respectfully withdraws the objections to the oath/declaration.

Drawings

2. The drawings were received on 4/15/04. These drawings are acceptable.

Response to Amendment

3. The Examiner notes that the Transmittal Document by which the substitute specification was submitted (i.e. "Submission of Substitute Specification") was located, and the statement as to a lack of new matter under 37 CFR 1.125(b) has been verified. In view of this, the submission of the substitute specification filed 1/22/02 is acknowledged and accepted.

4. The amendments to the specification and abstract of the disclosure in the submission dated 4/15/04 are acknowledged and accepted. In view of these amendments, the Examiner respectfully withdraws the objections to the specification in Sections 12-13 of the Office Action dated 1/15/04.

5. The amendments to Claims 23-25, 27 in the submission dated 4/15/04 are acknowledged and accepted. In view of these amendments, the objections and rejections

of Claims 23-35 in Sections 17-19 in the Office Action dated 1/15/04 are respectfully withdrawn.

6. The cancellation of Claims 36-39, 41-42, 45-46 in the submission dated 4/15/04 is acknowledged and accepted.

Specification

7. The disclosure is objected to because of the following informalities:

Page 27, line 9- 'λ_l' should read 'λ_i'.

Appropriate correction is required.

Response to Arguments

8. The Applicant argues that, with respect to Claims 23, 40, 43, and 44, Sato et al. in view of McGrew fails to teach or reasonably suggest a video screen hologram as a holographic image of a real video screen. The Examiner respectfully disagrees. The Examiner notes that Sato et al. specifically discloses that the video screen hologram (See for example Figure 16) is comprised of elementary holograms (See Figure 11). Each of the elementary holograms are holographic images of a particular point at a predetermined location of the diffusion screen (See 51, 52 in Figure 16), since it is the diffusion screen that acts as the object in the holographic recording process. The Examiner further notes that such diffusion screens (i.e. frosted glass, ground glass, diffusion plates and screens) are well known in the art for their use as video and projection screens, as evidenced for

example by Lee (U.S. Patent No. 3632181). No clear distinction has been made between the instant 'real video screen' and the diffusion screen of the prior art.

9. The Applicant argues that, with respect to Claims 23, 40, 43, and 44, Sato et al. in view of McGrew fails to teach or reasonably suggest that a real video screen is illuminated by narrow band light to generate a hologram of the real video screen, wherein the plurality of individual recordings is made by illuminating small portions of the real video screen so that a video screen hologram of the entire video screen is obtained by a composition of the individual recordings. After a review of the Sato et al. reference, the Examiner agrees that a video screen hologram of the entire video screen is not obtained by a composition of the individual recordings. However, it is noted that McGrew discloses two embodiments (See specifically Figures 1 and 8) wherein a plurality of individual recordings is made by illuminating small portions of the real video screen (i.e. the diffusion screen 120 in Figure 1, 905 in Figure 8) so that a video screen hologram of the entire video screen is obtained by a composition of the individual recordings.

10. The Applicants argue that, with respect to Claims 23, 40, 43, and 44, Sato et al. in view of McGrew fails to teach or reasonably suggest the use of a scanning pulsed laser beam being guided over the video screen to illuminate the video screen. The Examiner respectfully disagrees. It is noted that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413,

208 USPQ 871 (CCPA 1981). In the instant case, the teachings of McGrew suggest to one skilled in the art that one may utilize a scanned beam laser source to provide translation of the incident beams, similar to the translation of the holographic recording substrate that is disclosed by Sato et al. (See 42 in Figure 16; col. 15, lines 40-55).

11. Claims 23-35, 40, 43-44 are rejected as follows.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 23, 25-26, 30, 40, 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent No. 5926294), of record, in view of McGrew (U.S. Patent No. 5138471), of record.

Sato et al. discloses a method of producing a video screen hologram as a holographic image of a real video screen (See for example Figure 16; col. 15, line 7-col. 16, line 33), the hologram being either a transmission or reflection hologram (See col. 5, lines 49-55; col. 6, lines 21-43), by illuminating the real video screen (See 52 in Figure 16) with narrowband light (See 31 in Figure 16; col. 16, lines 3-8), such as by a semiconductor-driven Nd:YAG laser (See col. 16, lines 3-8), to generate a hologram of the real video screen (See 43 in Figure 16), the method comprising making a plurality of individual recordings by illuminating an area of the real video screen, the partial areas of the video

screen having a size that corresponds to image pixels (See for example Figure 11; Abstract); and forming video screen hologram of a portion of the video screen by a composition of the individual recordings (See col. 15, line 7-col. 16, line 33), the illumination of the video screen being performed by scanning the substrate and holographic recording medium (See col. 15, line 40- col. 16, line 2). Further, Sato et al. discloses the video screen hologram manufactured from the above method (See 42, 43 in Figure 16; Abstract; Figure 11), wherein the video screen hologram comprises a plurality of individual recordings, in each of which a partial area of the real video screen is imaged as a hologram, an entire image of the whole video screen resulting from assembled or superimposed individual recordings (See col. 15, line 7-col. 16, line 33), the illumination of the video screen being performed by scanning the substrate and holographic recording medium (See col. 15, line 40- col. 16, line 2). Sato et al. lacks sequentially illuminating partial areas of the real video screen to form a video screen hologram of the entire video screen or the illumination of the video screen being performed using a scanning pulsed laser beam. However, McGrew teaches a method for recording holographic images onto a holographic recording medium by recording an array of pixels (See for example Abstract), wherein a scanned pulse laser is utilized for illumination (See in particular Figure 5; col. 8, lines 19-36). McGrew additionally teaches that the diffusion screen of the apparatus (See for example 120 in Figure 1; 905 in Figure 8) may be illuminated in plural partial areas such as to form a hologram of the entire diffusion screen. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to sequentially illuminate partial areas of the real video screen to

form a video screen hologram of the entire video screen and to have the illumination of the video screen be performed using a scanning pulsed laser beam, as taught by McGrew, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al., for the purpose of 1) providing point-by-point image recording for generation of larger, composite holograms, and 2) providing high-speed illumination and recording of the holograms, and reduced manufacturing times, since high speed laser beam scanning and high pulse rates are more easily attained than high speed raster scanning movement of the holographic substrate and medium.

14. Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 24, except for the pulse duration being dimensioned such that the movement of the laser beam over the video screen has substantially no effect on interference of the light waves in the hologram, the movement of the laser beam during a pulse being smaller than 1/10 of the wavelength. However, it is well known in the art of interferometry and holography that one must control the laser pulse width, as well as the movement speed of the workpiece upon which the interference pattern is incident upon, to avoid 'smearing' the interference fringes, and hence reducing the fringe visibility of the interference pattern. Optimal fringe visibility may be obtained by a combination of reducing the laser pulse width and reducing the movement speed of the workpiece. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the pulse duration be dimensioned such that the movement of the laser beam over the

video screen has substantially no effect on interference of the light waves in the hologram, the movement of the laser beam during a pulse being smaller than, for example, 1/10 of the wavelength, for the purpose of optimizing the fringe visibility of the interference fringes, thus leading to the production of a bright reconstructed image.

15. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Sukhman (U.S Patent No. 4338578), of record.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for a frequency conversion taking place in one or several of the wavelength ranges red, green, blue. However, Sukhman teaches the use of a multicolor pulsed coherent light source (See for example Figure 1) for use in full color holography, wherein the frequency conversion of red and infrared wavelengths is utilized to generate green and blue wavelengths (See col. 2, line 33- col. 3, line 34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a frequency conversion take place in one or several of the wavelength ranges red, green, blue, as taught by Sukhman, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al., for the purpose providing the three primary color wavelengths (i.e. red, green, and blue) for holographic recording, while maintaining the required coherence among the three wavelengths.

16. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claims 23-24 above, and further in view of Gnädig et al. (DE19700162A1, or Gnädig 162), of record.

Sato et al. in view of McGrew discloses the invention as set forth above in Claims 28-29, except for a contact hologram or video screen plane hologram being generated. However, Gnädig 162 teaches a method for generating a holographic screen for laser front projection (See for example Abstract; Figures 1-2), wherein a contact hologram is formed by contact of the diffusion screen (See 11 in Figure 1; 21 in Figure 2) with the holographic medium (See 12 in Figure 1; 22 in Figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a contact hologram or video screen plane hologram be generated, as taught by Gnädig 162, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of maximizing the amount of scattered light captured/recorded by the holographic medium, and reducing the complexity of the recording apparatus, since a separate reference beam optical system (i.e. additional beam splitters, beam steering mirrors, lenses) is not required (the reference beam is generated by the scattered light from diffusion screen itself).

17. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23. Sato et al. in view of McGrew does not specifically disclose laser beams of a coherence length being generated which are greater than a difference between light paths of the object beam and the reference beam. However, as is known in the art of interferometry and holography, satisfactory holograms are obtained when the maximum optical path

difference between the object and reference beams in the recording system are much less than the coherence length of the light from the laser. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the source of Sato et al. in view of McGrew generate laser beams of a coherence length which are greater than a difference between light paths of the object beam and the reference beam, for the purpose of producing a satisfactory, usable hologram with reasonable fringe visibility.

18. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Arns et al. (U.S. Patent No. 4456328), of record.

With regard to Claim 33, Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for a repeated scanning of the video screen surface taking place by means of a respectively phase-shifted laser beam. However, Arns et al. teaches a hologram-forming system (See for example Figure 5) for producing diffusion type holograms, wherein a phase-shifted laser beam (See for example col. 2, lines 20-51) is used to record the holograms. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the a repeated scanning of the video screen surface taking place by means of a respectively phase-shifted laser beam, as taught by Arns et al., in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of reducing or eliminating spurious hologram

recordings caused by unwanted reflections from the surfaces of the optical elements in the system.

With regard to Claim 34, Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for the distribution of the lumination in the hologram being measured to correct lumination in a subsequent lumination cycle. However, Arns et al. teaches a hologram-forming system (See for example Figures 5 and 7) for producing diffusion type holograms, wherein a phase-shifted laser beam (See for example col. 2, lines 20-51) is used to record the holograms. Further, photodetectors (See for example 204, 206) are utilized within the optical system as optical beam pick-up for the reference and object beams so that a comparison may be made with respect to each beam's intensity for feedback during subsequent hologram writing cycles (See col. 7, line 36-col. 8, line 42). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the distribution of the lumination in the hologram being measured to correct lumination in a subsequent lumination cycle, as taught by Arns et al., in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of providing optical feedback and reduce the optical system's dependence on the source's absolute power output.

19. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Hariharan (P. Hariharan, 'Optical holography: Principles, techniques, and applications', Cambridge University Press, Cambridge, 1996, pp. 69-84, 181-184.), of record.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for the plural luminations being carried out with mutually perpendicularly polarized energy beams to produce two mutually independent screen images in the hologram. However, Hariharan teaches the use of standard polarization recording techniques for recording multiple holograms of varying polarization characteristics onto a holographic recording medium (See pp. 181-184). For example, Hariharan teaches a particular arrangement (See Figure 11.1 on Page 182) wherein orthogonally polarized reference beams are used to record two holograms, each having characteristics of one of the two orthogonal polarizations (See Section 11.1.1 on Page 181). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the plural luminations be carried out with mutually perpendicularly polarized energy beams to produce two mutually independent screen images in the hologram, as taught by Hariharan, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of precisely recording and recreating the polarization state of the object beam, which is generally lost in normal holographic techniques.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 3632181 to Lee.

Lee is being cited to evidence the conventional use of diffusion screens/plates (See for example 31 in Figures 2-3, 5) as display screens.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
6/14/04

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